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June 18, 1996

Office of the Secretary

Federal Communications Commission

Washington, DC 20554

DOCKET FILE COPY ORIGINAL

Dear Secretary:

Enclosed are an original and nine copies of comments concerning ET Docket No. 96-8, RM-8435, RM-8606, RM-8609.

Sincerely,

Glendon R. Whitehouse
President

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**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of

Amendment of Parts 2 and 15 of the
Commission's Rules Regarding Spread
Spectrum Transmitters

)

)

) ET Docket No. 96-8

) RM-8435, RM-8606, RM-8609

)

To : The Secretary

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COMMENTS OF THE CUSHCRAFT CORPORATION

Cushcraft Corporation ("Cushcraft") hereby submits comments on the above-captioned petitions for rule making being responded to by the Commission in this NPRM ("NPRM") in ET Docket No. 96-8. These petitions for rule making were filed by (1) Western Multiplex Corporation ("WMC"), (2) SpectraLink Corporation ("SpectraLink"), and (3) Symbol Technologies, Inc. ("Symbol").

Cushcraft is a major U. S. manufacturer of radio antennas used in the land mobile radio services, the Amateur Radio Service, Personal Communications Service ("PCS"), and in unlicensed, Part 15 applications.

As a manufacturer of antennas used with unlicensed, Part 15 devices, Cushcraft is well aware of the significance of the Commission's rules and regulations in this area. Cushcraft strongly believes that the creation of the unlicensed, Part 15 market represents one of the most successful policy initiatives ever undertaken by the Commission. As the Part 15 Coalition observed "Today, this market is comprised of millions of devices, hundreds of applications, scores of different technologies, and countless hundreds of millions of dollars of investment."¹ As the Part 15 Coalition also observed, the success of unlicensed Part 15 devices has far exceeded early expectations.

Despite the fact that tens of millions of unlicensed devices are relied upon by ordinary consumers, businesses, and government agencies on a daily basis, that market place success is often overshadowed by greater publicity afforded licensed services such as cellular mobile radio. This relative lack of publicity should not be allowed to detract from the enormous success of the Commission's policies and rules toward unlicensed devices and operations. The unlicensed devices and systems operating under the Part 15 rules are subject to numerous constraints and increasing congestion; nonetheless, enormous growth has occurred in the Part 15 market even in the face of significant handicaps. Given the enormous success of the existing

¹ See comments of the Part 15 Coalition concerning RM-8653 and RM-8648.

unlicensed technologies even in the face of significant constraints, and in reflecting upon the potential importance of unlicensed technologies and applications to the future of the nation's information infrastructure, Cushcraft believes it is only prudent that the Commission continue to facilitate operations under its Part 15 rules.

One of the major advantages of the Commission's Part 15 rules is that they significantly reduce the barriers to entering the radio device and radio systems markets. Well-drawn rules governing the user of Part 15 spectrum will continue the benefits of low entry barriers. This will allow manufacturers, such as Cushcraft, that literally began in a garage and grew to become a significant producer of a wide range of antennas for both licensed and unlicensed applications, to contribute more fully to the development of the nation's infrastructure right along with larger companies.

Specific comments on the NPRM

1. The Commission's proposal to eliminate the directional antenna gain limit for spread spectrum systems operating in the 5800 MHz band for fixed, point-to-point links for non-consumer applications.

As the Commission points out, the 5800 MHz band has very little use today, just as the 915 and 2450 MHz bands had some time back when the Commission did not place a limit on maximum spread spectrum system antenna gains. This prior policy gave users the flexibility to employ Part 15 technology in a wide range of applications, thereby stimulating the user of Part 15 devices and systems. The Commission's proposal to allow substantial antenna directivity for point-to-point spread spectrum system links in the relatively little used 5800 MHz band would have a similar beneficial stimulation of demand for Part 15 devices and systems.

With little mobile and hand-held use in this band, interference would be much easier to control. Additionally, the relatively high frequency of operation makes the manufacture of the needed relatively high gain antennas more economical due to the reduced size for a given directive gain, which, in turn, makes the deployed antennas less conspicuous with less visual impact on the environment.

Due to concerns with potential RF hazards to humans, Cushcraft supports the Commission's proposal to restrict the availability of these high gain antennas to the general public by limiting the marketing of them to commercial and industrial operations.

With the above in mind, Cushcraft supports the Commission's proposal in paragraph 9 of the NPRM to eliminate the antenna directional gain limit only for non-consumer, fixed, point-to-point spread spectrum systems operation in this 5800 MHz band

2. Eliminate the directional antenna gain limit of 6 dB in the 2450 MHz band?

Cushcraft is concerned that increasing this limit would cause excessive interference to many other devices/systems operating in this band. As the Commission points out in paragraph 12 of the NPRM, high gain antennas primarily benefit fixed operations.

Cushcraft believes that high-gain, fixed, point-to-point antennas would cause too much interference to the proliferation of systems employing lower gain antennas, such as WLANs, as opposed to the 5800 MHz band where overall usage is very much lower with fewer mobile and portable users. The increasing proliferation of mobile and portable user terminals in the 2450 MHz band is especially not very compatible with high-gain, fixed, point-to-point systems. Therefore, Cushcraft is opposed to the Commission eliminating the directional antenna gain limit of 6 dB in the 2450 MHz band.

3. Responsible party for ensuring minimum RF exposure to the public from the Commission's proposed 5800 MHz spread spectrum systems having high-gain antennas for fixed, point-to-point operations.

In paragraph 14 of the NPRM, the Commission states "In order to meet our obligation under the National Environmental Policy Act, we proposed to hold the holder of the grant of certification for the transmitter, the grantee, responsible for ensuring that the equipment is designed to minimize exposure of the public to excessive radio frequency (RF) signals. While we proposed to make the operator responsible for ensuring that the system is used only for fixed, point-to-point applications, the means to prevent excessive exposure levels can be incorporated into the equipment design."

Proposed Part 15.247(b)(4)(ii) in the NPRM states "The operator of the spread spectrum intentional radiator is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operation of this responsibility." Further, in paragraph 14 of the NPRM the Commission states, concerning a possible RF exposure hazard warning, "A possible method is a sign, attached to the antenna and of sufficient size and visibility, warning the public of the potential danger of RF exposure. Another possible method is the incorporation of proximity sensors that causes the transmitter to automatically decrease output power if someone wanders too close to the transmitting antenna."

Cushcraft supports the use of a warning sign as being a reasonable protective measure against excessive exposure to RF hazards but it is against the rather extreme measure of having the antenna output power controlled by a proximity sensor, a technique that would add substantial cost to a system. Cushcraft supports language in the installation instructions giving specific techniques of reducing the risk of excessive exposure by proper planning and implementation of equipment and antenna installation. Besides the warning sign, the installation instructions could include suggestions for locating the antenna where it is very unlikely that the general public could get close enough that excessive exposure hazard could exist.

4. Legal antennas used with intentional radiators

Part 15.203 of the existing Commission Rules states "An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may

design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited..... Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and field disturbance sensors, or to other intentional radiators which, in accordance with Part 15.31(d), must be measured at the installation site.”

Paragraph 44 of the NPRM states “Similarly, we propose to amend the regulations to state that the use of an antenna, other than the with which the product was originally certified, is in violation of the rules.”

Cushcraft would support the above change if the provisions of 2.1043(b)(2) concerning Class II permissive changes to certificated equipment remain in effect. These provisions are necessary so that equipment manufacturers can offer technologically current solutions.

5. Proposed Part 15.247(b)(4)(iv): “The 3dB beamwidths, in both the horizontal and vertical planes, of antennas employed under the provisions of (b)(4) of this section shall not differ by more than a factor of two.

This proposed rule part refers to the proposed subpart (b)(4) of Section 15.247 that proposes the use of high gain 5800 MHz band antennas for fixed, point-to-point operations.

In paragraph 17 of the NPRM the Commission states, “We believe that any interference problems resulting from excessive vertical emissions could be resolved if the 3 dB beamwidth, in both the vertical and horizontal planes, of the high gain directional antennas employed with these fixed, point-to-point systems differ by no more than a factor of two and are proposing such a limit.”

Cushcraft does not believe that such a restriction on the relative vertical and horizontal beamwidths of these antennas would significantly resolve interference problems, if indeed, any overall, on average, lessening of interference problems would result. Interference problems can occur in both widespread vertical and horizontal portions of an antenna’s radiating pattern. Just as a wider vertical beamwidth could illuminate a larger number of floors in a given building, a wider horizontal beamwidth would illuminate a larger portion of each floor, or even floors on multiple buildings. Besides, Cushcraft believes the vast majority of antennas meet the Commission’s proposed limit of having a ratio of the horizontal and vertical beamwidths of no more than 2:1

Even with very high gain Yagi antennas, the vertical beamwidth is still appreciable so that several stories of a building would be illuminated at quite short distances. For example, a Yagi antenna with a 3 dB vertical beamwidth of just 20 degrees would illuminate all of a five story building located only 200 feet away from the antenna. And, of course, appreciable radiated energy falls outside the half-power (-3 dB) beamwidth of the antenna’s radiation pattern.

Accordingly, Cushcraft does not see how the Commission's relative beamwidth proposal would significantly, if at all, promote its objective of minimizing interference problems. Therefore, Cushcraft is opposed to the Commission setting such a limit on the manufacture of antennas.

Respectively submitted,

A handwritten signature in black ink, appearing to read "Glendon R. Whitehouse". The signature is fluid and cursive, with the first name "Glendon" and last name "Whitehouse" clearly distinguishable.

Glendon R. Whitehouse
President
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June 19, 1996